IBM Systems & Technology Group
Solution Brief

**Highlights**

**Better patient care management:** Supports the individual with the right programs and treatments throughout the full cycle of care including hospitalization, outpatient visits, physical therapy, laboratory testing and other medical interventions.

**Enhanced clinician mobility, collaboration and productivity:** Clinicians and associated staff can bring their own device (BYOD), get secure single sign-on to the clinical information system, direct output to nearest printers and deliver effective healthcare while roaming or remote.

**Validated and tested clinical information management solution:** Healthcare organizations can reduce the risks, costs and complexity of deploying solutions for Electronic Medical Records (EMRs).

**Improved operational efficiency and flexibility:** Providers of all sizes can deliver faster, error-free and more efficient healthcare from multiple access devices located anywhere through a reliable, secure and fully-integrated clinical information management solution that avoids expensive desktop refreshes, and simplifies application and desktop management.

**Patient information protection and compliance:** Policy-based access control, auditing, reporting and remote device wipe help keep patient data and other sensitive content secure while facilitating compliance with HIPAA and other regulations.

**Optimized for virtualization performance at lower costs:** Pre-built, fully-integrated systems with servers, storage and networking, all virtualized, and with streamlined IT administration through a single window.

**Lower storage costs with increased performance:** Additional cost savings with storage optimization software; simplified storage and networking by using the server RAM as primary storage to lower CAPEX and OPEX costs; eliminate storage and network bottlenecks that cause session freezes, poor application performance and help desk calls; automated deployment that reduces mistakes, while enabling high availability and disaster recovery.

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**Enhancing provider productivity and collaboration for smarter healthcare**

IBM®, Citrix® and Atlantis Computing® provide secure, reliable, ubiquitous and fast access to clinical information

The healthcare industry is struggling as costs continue to skyrocket with little improvement in patient outcomes. All stakeholders in the healthcare ecosystem – providers, payers, governments, biopharmaceutical companies, medical device and diagnostic firms, employers, and other public health organizations – must collaborate in innovative ways to drive better outcomes for the individual patient. This requires a holistic patient-centric approach on prevention, early intervention, and clinical care management typically provided, when required, by providers (hospitals, physicians, nurses, therapists and other practitioners). This required collaboration will see a massive increase in data and information that needs to be available and accessible by the appropriate stakeholders.

Many providers are deploying patient-centric Electronic Medical Records (EMR) systems as a means to contain these escalating clinical care management costs while driving greater clinician collaboration and productivity, all with the goal of better patient outcomes. EMR systems aggregate data around patients throughout their care lifecycle; use common data definitions for laboratory tests, diagnoses, treatments, and other interventions; and provide a consistent, comprehensive repository of all types of patient data including physician notes, chemotherapy orders, radiological images and other data. Prominent suppliers of EMR software include application providers like Epic, Cerner, MEDITECH and others.

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Providers Collaborating for Better Patient Outcomes
Healthcare providers of all sizes are investing heavily in robust, resilient and secure EMR systems built using cloud computing technologies to provide a firm foundation for clinical information and promote greater clinician mobility, collaboration and productivity. This is essential as the healthcare industry continues to consolidate – driven by mergers and acquisitions designed to improve healthcare industry economics. Desktop virtualization provides a simple and cost-effective way to standardize EMR application delivery and quickly integrate acquired organizations. Providers face additional pressures to cut care management costs and enhance clinical and administrative workflow. These pressures coupled with stringent and changing rules and regulatory guidelines require robust clinical information systems including EMRs that can seamlessly integrate complexities of different merging partners to provide faster, error-free and more efficient healthcare delivery.

**Enhancing Mobility, Collaboration and Productivity**

The benefits of enabling clinician and staff mobility are immense for providers. Clinicians can use any supported device for each situation, including their own personal device, as they move seamlessly between hospital beds using a tablet or a workstation in the prep room or their smartphone between locations – all with complete access to clinical information and applications. Business and administration staff members get additional flexibility to efficiently schedule appointments, refill prescriptions and communicate with clinicians, patients and other stakeholders in the healthcare ecosystem. Providers can also empower patients with highly relevant information and deliver better care remotely through telemedicine, and Accountable Care Organizations. With a mobile workforce and desktop virtualization, providers can improve employee work-life balance and flexibility while reducing on-site costs and delivering a user experience that is superior to a physical PC.

As connected healthcare communities continue to grow through industry consolidation, IT investments to enable mobility can be leveraged to simplify the process of assimilating new members into the environment. Instead of waiting until complex systems integrations are complete; organizations can provide secure access to the clinical information system almost immediately, ensuring continuity for patients and health providers during the transition.

But there are three key IT challenges that must be overcome:
1. as clinicians and staff roam across locations, devices and networks, they must have a consistent and convenient experience;
2. security, patient privacy and regulatory compliance must be maintained; 3. the IT infrastructure must be easy-to-manage, scalable and reliable, delivering the best performance at lowest cost.

To solve the preceding IT challenges, the infrastructure solution must include endpoint management, single sign-on, desktop and application virtualization and cloud networking, all anchored on an integrated high-performance system optimized for clinical applications, EMRs and virtualization.

**An Optimized Secure Infrastructure Solution**

Together IBM®, Citrix® and Atlantis Computing® offer world-class solutions to help healthcare organizations implement, manage and scale a more cost-effective, centralized and virtualized clinical information system, including EMR.

**IBM SmartCloud® Desktop Infrastructure** offers robust, cost-effective, and manageable virtual desktop solutions for healthcare organizations with the following benefits:
- Lowers the total cost of ownership (TCO) over an extended period compared to traditional PCs
- Simplifies desktop administration, support, and management
- Enhances security and compliance management
- Improves availability and reliability
- Enables users to work anytime, anywhere quickly and easily regardless of location or device
- Better supports growth initiatives for mobility and flexible work locations
Key components of this infrastructure solution include:

1. **Citrix NetScaler**™ enables the IT organization to optimize, secure and control the delivery of healthcare apps, cloud services, virtual desktops and mobile services. A unified management framework provides load balancing, global traffic management, security, data scaling, app visibility and desktop delivery to help healthcare organizations grow, while consolidating data centers to minimize risk and costs. Access control, auditing and reporting help IT manage compliance, information governance and data protection. As healthcare organizations seek to increase IT efficiency and integrate acquired providers while minimizing cost, NetScaler makes it possible to consolidate critical network services on a single hardware platform with no loss of performance, and meet diverse application needs in a multi-tenant environment.

2. **Citrix XenApp®** is an application delivery solution that enables any Windows® application to be virtualized, centralized and managed in the data center, and instantly delivered as a service to users anywhere on any device. Virtual application delivery with XenApp enables healthcare organizations to improve application management by:
   - Centralizing applications in the data center
   - Controlling and encrypting access to data and applications to improve security
   - Delivering applications instantly to users anywhere on any device
   - Simplifying and automating the process of delivering or updating applications

3. **Atlantis ILIO™** storage optimization software with IBM PureFlex or IBM Flex System complements Citrix XenDesktop and XenApp to simplify and automate the deployment of infrastructure to support thousands of virtual desktops and applications, while enabling high availability and disaster recovery. The solution delivers consistently better-than-PC performance as projects scale, while lowering storage CAPEX and OPEX costs by up to 80% and eliminates the risk of storage and network bottlenecks that can cause session freezes, poor application performance and more help desk calls.

4. **IBM PureFlex and IBM Flex System** each combines a no-compromise system design along with built-in expertise and integrates them into complete, optimized solutions. This fully integrated infrastructure platform supports a mix of compute, storage, and networking resources. This system is simple to acquire and deploy quickly, and can automatically adapt to changing operating conditions. Healthcare providers can reduce risk with the built-in broad patterns of expertise and proven guidelines in systems management, applications, and hardware maintenance. These expert systems’ capabilities drive new levels of provider productivity and operational efficiencies.

5. **IBM Storwize V7000 and IBM Flex System V7000 Storage Node** are powerful block storage systems that combine hardware and software components to provide a single point of control to help support improved storage efficiency. By enabling virtualization, consolidation, and tiering for healthcare organizations of all sizes, it is designed to improve application availability and resource utilization. The system offers easy-to-use, efficient, and cost-effective management capabilities for both new and existing storage resources, and reduces floor space and TCO for healthcare IT organizations.

6. **IBM FlashSystem Storage** provides high-performance, low-latency storage solutions that:
   - Improve business agility with scalable, extreme-performance flash storage that accelerates low latency, I/O-intense applications, increasing storage utilization by 50%
   - Easily integrate with existing infrastructure to maximize return on investment (ROI), reducing software licensing by 38%
   - Operate at peak efficiency with IBM MicroLatency™, high bandwidth, flexible connectivity and low wattage—all in a small footprint, reducing environmental costs by 74%
   - Leverage high availability and hot-swappable components to lower mean time to repair
   - Add comprehensive enterprise management features with SAN Volume Controller (SVC)

By optimizing how virtual desktop and applications consume storage, Atlantis ILIO In-Memory Storage™ technology allows Citrix instances to be run in IBM server RAM with user profiles stored on the IBM Storwize® V7000 or IBM FlashSystem™ storage. It also improves predictability of storage usage for PVS write cache sizing and growth.
Building on a Strong Partnership

With more than 20 years of close partnership and cooperation, Citrix and IBM have developed a joint approach to virtualization that is designed to optimize the end-user experience, benefit the business and simplify the complex implementation and support of EMRs and other clinical systems. IBM has been a leader in large-scale virtualization for four decades, building strong intellectual capital and experience as a trusted advisor. Atlantis Computing is recognized as an industry expert in desktop virtualization and storage, based on their success in designing and implementing some of the world’s largest desktop virtualization deployments. By partnering with Atlantis Computing, IBM and Citrix are ready to help your organization address the ever increasing healthcare industry challenges of rising costs, regulatory changes and increased customer expectations by providing a flexible solution to manage and deliver clinical information and EMRs to:

- Deliver better patient care management
- Enhance clinician collaboration and productivity
- Improve provider operational efficiency and flexibility
- Optimize virtualization performance at lower costs
- Lower storage costs with no performance problems

Atlantis Computing, Citrix and IBM are enhancing provider productivity and clinician and staff mobility and collaboration, to deliver higher quality of care throughout the healthcare ecosystem at lower cost.

For More Information

For more information about IBM Healthcare solutions, contact your IBM sales rep or visit:
IBM Healthcare Solutions: www.ibm.com/industries/healthcare

For more information about Citrix solutions for healthcare, please visit www.citrix.com/healthcare

For more information about Atlantis Computing, please visit
www.atlantiscomputing.com/ibm

To learn more about IBM SmartCloud Desktop Infrastructure using Citrix on IBM PureFlex and IBM Flex System, see your IBM representative or IBM Business Partner, or visit:
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